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<b>Division of Forensic Science</b> <b>FIREARM/TOOLMARK TRAINING MANUAL</b>		Amendment Designator:
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<b>8 EXAMINATION OF FIREARMS</b>		
<b>8.1</b>	<b>Assignments</b>	
8.1.1	<p>Define each of the following types of firearms and explain in detail the operation of each type to include the loading of cartridges and the subsequent movement of the cartridge case and/or bullet after firing.</p> <ul style="list-style-type: none"> <li>• Revolver, single and double action</li> <li>• Autoloading pistol, single and double action</li> <li>• Derringer and single shot pistols</li> <li>• Bolt-action rifle</li> <li>• Autoloading rifle</li> <li>• Pump-action rifle</li> <li>• Various single shot rifles</li> <li>• Submachine gun</li> <li>• Assault rifle</li> <li>• Muzzle loading firearm</li> <li>• Percussion revolvers</li> </ul> <p><b><i>(Use Training Assignment #11 to complete this objective.)</i></b></p> <div> <div>_____</div> <div>_____</div> <div>Training Officer</div> <div>Date</div> </div>	
8.1.2	<p>Explain and illustrate the differences between a gas-operated and a recoil-operated autoloading shotgun.</p> <p><b><i>(Use Training Assignment #12 to complete this objective.)</i></b></p> <div> <div>_____</div> <div>_____</div> <div>Training Officer</div> <div>Date</div> </div>	
8.1.3	<p>Explain and illustrate the differences between the following types of autoloading pistols:</p> <ul style="list-style-type: none"> <li>• Blowback action</li> <li>• Delayed blowback action</li> <li>• Gas-delayed blowback action</li> <li>• Short recoil action</li> <li>• Long recoil action</li> </ul> <p><b><i>(Use Training Assignment #12 to complete this objective.)</i></b></p> <div> <div>_____</div> <div>_____</div> <div>Training Officer</div> <div>Date</div> </div>	
8.1.4	<p>Partially disassemble and reassemble the following revolvers. Photograph and note the differences in their mechanisms. Identify each part by name.</p> <ul style="list-style-type: none"> <li>• Smith &amp; Wesson double-action revolver</li> <li>• Colt double-action revolver</li> <li>• Ruger double-action revolver</li> </ul>	

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<div> <ul style="list-style-type: none"> <li>• "Old style" Ruger single-action revolver</li> <li>• "New style" Ruger single-action revolver</li> </ul> </div> <div> <p><b><i>(Use Training Assignment #15 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.5 Field strip and reassemble the following pistols. Note and photograph differences in their mechanisms. Identify each part by name.</p> </div> <div> <ul style="list-style-type: none"> <li>• 9mm Luger Browning, Hi-power, pistol</li> <li>• .45 Auto caliber U.S. Pistol, Model 1911A1, pistol</li> <li>• 9mmLuger Steyr, GB, pistol</li> <li>• 9mm Luger Glock, Model 17, pistol</li> <li>• 9mm Luger Beretta, Model 82F, pistol</li> <li>• 9mm Luger SIG-Sauer, Model 226, pistol</li> <li>• 9mm Luger Smith &amp; Wesson, Model 669, pistol</li> <li>• 9mm Luger H&amp;K, P7, pistol</li> <li>• 357 Magnum Desert Eagle pistol</li> <li>• 9mm Luger Walther P38 pistol</li> <li>• 380 Automatic Walther PPK pistol</li> <li>• 8mm Arisaka Type 14 pistol</li> <li>• 9mm Luger P08 pistol</li> </ul> </div> <div> <p><b><i>(Use Training Assignments #16, #17, and #18 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.6 Field strip and reassemble the following submachine guns. Note differences in the mechanism and operation of each. Make appropriate photographs for your notes and identify the major parts by name.</p> </div> <div> <ul style="list-style-type: none"> <li>• .45 Auto caliber RPB Industries, M10, submachine gun (open bolt and closed bolt)</li> <li>• 9mm Luger SWD Inc., M11/Nine, submachine gun</li> <li>• 9mm Uzi submachine gun</li> <li>• 9mm H&amp;K, MP5, submachine gun</li> <li>• .45 Auto caliber US M3 submachine gun</li> <li>• 9mm Intratec, TEC 9, submachine gun</li> <li>• .45 Auto caliber Thompson submachine gun</li> </ul> </div> <div> <p><b><i>(Use Training Assignment #19 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.7 Be familiar with the operation of each of the following firearms. Identify the major parts by name and make appropriate notes.</p> </div> <div> <ul style="list-style-type: none"> <li>• .30-06 Springfield caliber U.S. Rifle, Model M1</li> <li>• .308 Winchester caliber U.S. Rifle, Model M14</li> <li>• .223 Remington caliber U.S. Rifle, Model M16</li> </ul> </div>	

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<div> <ul style="list-style-type: none"> <li>• .300 Savage caliber, Savage, Model 99, rifle</li> <li>• .30-30 Winchester caliber Winchester Model 94 rifle</li> <li>• 7.62x39mm caliber AK47/74 and SKS rifle</li> <li>• .30-40 Krag caliber U.S. Rifle 1898</li> <li>• .303 British caliber Lee Enfield rifle</li> <li>• .30-06 Springfield caliber U.S. Rifle, Model 1903</li> </ul> </div> <div> <p><b><i>(Use Training Assignments #21 and #22 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.8 Be familiar with the operation of each of the following shotguns. Identify the major parts by name and make appropriate notes.</p> </div> <div> <ul style="list-style-type: none"> <li>• Remington, Model 870, shotgun</li> <li>• Winchester, Model 12, shotgun</li> <li>• Ithaca, Model 37, shotgun</li> <li>• Browning, Model A5, shotgun</li> <li>• Remington, Model 1100, shotgun</li> <li>• Harrington &amp; Richardson, Topper Model 158, shotgun</li> <li>• L.C. Smith, side-by-side, double-barrel, shotgun</li> <li>• Savage, Model 311, side-by-side, double-barrel, shotgun</li> <li>• Beretta, Silver Snipe, over-under, double-barrel, shotgun</li> </ul> </div> <div> <p><b><i>(Use Training Assignment #23 and #24 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.9 Be familiar with the operation of each of the following firearms. Identify the major parts by name and make appropriate notes.</p> </div> <div> <ul style="list-style-type: none"> <li>• .22 caliber Browning autoloading rifle</li> <li>• .22 caliber Winchester, Model 62, rifle</li> <li>• .22 caliber Remington, Model 582, rifle</li> <li>• .22 caliber Ruger, Model 10/22, rifle</li> <li>• .22 caliber Ruger, MKII, pistol</li> <li>• .22 caliber Colt, Woodsman, pistol</li> <li>• .22 caliber Raven, Lorcin, Jennings</li> </ul> </div> <div> <p><b><i>(Use Training Assignment #25 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.10 Be familiar with the operation of each of the following firearms. Identify the major parts by name and make appropriate notes.</p> </div> <div> <ul style="list-style-type: none"> <li>• .25 Auto caliber Raven Arms pistol</li> <li>• .25 Auto caliber Colt Jr. pistol</li> </ul> </div>	

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<ul style="list-style-type: none"><li>• .25 Auto caliber Beretta pistol</li><li>• .25 Auto caliber Bauer pistol</li></ul> <p><b><i>(Use Training Assignment #20 to complete this objective.)</i></b></p> <div><div>_____</div><div>_____</div><div>Training Officer</div><div>Date</div></div> <p>8.1.11 Be familiar with the Firearm Section Range Rules and Safety Rules regarding firearms. Demonstrate, using firearms from No. 4 through No. 9 above and others, how to place firearms in a safe condition, how to load and unload each, how to handle and carry these firearms in the Laboratory, and how to safely test fire each of these different types of firearms.</p> <p><b><i>(Use Training Assignments #15 through #25 to complete this objective.)</i></b></p> <div><div>_____</div><div>_____</div><div>Training Officer</div><div>Date</div></div> <p>8.1.12 Using the firearms in No. 4 through No. 9 above, study the various safety mechanisms employed in each design. Include thumb safety, grip safety, magazine safety, firing pin block, transfer bar, and any other mechanical safety. Illustrate how the firing mechanisms are blocked, interrupted, or otherwise stopped from operating.</p> <p><b><i>(Use Training Assignments #15 through #29 and Practical Exercises #3 through #6 to complete this objective.)</i></b></p> <div><div>_____</div><div>_____</div><div>Training Officer</div><div>Date</div></div> <p>8.1.13 Be familiar with the Firearm Section equipment used for measurement of trigger pull. Determine the trigger pull on at least one firearm from each of the firearms listed in the No. 4 through No. 9 groups, using various methods and compare the results.</p> <p><b><i>(Use Training Assignments #15 through #29 and Practical Exercises #3 through #6 to complete this objective.)</i></b></p> <div><div>_____</div><div>_____</div><div>Training Officer</div><div>Date</div></div> <p>8.1.14 Discuss with the Training Officer the protocol to be used in determining whether a firearm "<i>can be made to fire without pulling the trigger.</i>" Demonstrate, using one firearm from each of the No. 4 through No. 9 groups of firearms above, how to conduct this type of examination.</p> <p><b><i>(Use Training Assignments #15 through #29 and Practical Exercises #3 through #6 to complete this objective.)</i></b></p> <div><div>_____</div><div>_____</div><div>Training Officer</div><div>Date</div></div> <p>8.1.15 Research, define, and/or determine the implications of the following terms as they relate to safety in the operation of a firearm.</p> <ul style="list-style-type: none"><li>• Excessive headspace</li><li>• Bore obstruction</li></ul>		

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<div> <ul style="list-style-type: none"> <li>• Barrel bulge</li> <li>• Broken extractor</li> <li>• Push off</li> <li>• Trigger shoe</li> <li>• False half-cock</li> <li>• Slam-fire</li> <li>• Inadequate/improper sear engagement</li> <li>• Defective safety</li> <li>• High primer</li> <li>• Rail splitting</li> <li>• Hairline cracks</li> <li>• Improper timing</li> <li>• Excessive pressure</li> <li>• Dented barrel</li> <li>• Jar-off</li> </ul> </div> <div> <p><b><i>(Use Training Assignment #28 and Practical Exercise #5 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.16 Become familiar with the Section firearm range including its physical dimensions, construction of walls and backstop, and bullet velocity limitations. Know how to test fire firearms thought to be possibly unsafe. Become familiar with the use of all the equipment on the range. Know the range rules and emergency medical treatment procedures.</p> </div> <div> <p><b><i>(Use Training Assignment #28 and Practical Exercise #5 to complete this objective.)</i></b></p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.17 Attend armorer training offered by various manufacturers of firearms, at their manufacturing facilities, if possible. Coordinate these with the Training Officer.</p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.18 Explore the capabilities in restoring an inoperable evidence firearm to operating condition and also know the limitations and reservations, which must be considered. Discuss these with the Training Officer.</p> </div> <div> <p>_____ Training Officer</p> </div> <div> <p>_____ Date</p> </div> <div> <p>8.1.19 Review and record the references in the Firearm Section library, which can be used to identify the manufacturer and/or source of a firearm using the following criteria:</p> </div> <div> <ul style="list-style-type: none"> <li>• Proof marks</li> <li>• Inspector marks</li> <li>• Factory numbers and markings</li> <li>• Serial number</li> <li>• Part numbers</li> <li>• Company logos</li> </ul> </div>	

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<p align="center"><b><i>(Use Training Assignment #29 and Practical Exercise #6 to complete this objective.)</i></b></p> <div> <div>_____</div> <div>Training Officer</div> </div> <div> <div>_____</div> <div>Date</div> </div> <p>8.1.20 Discuss the following topics with the Training Officer and become familiar with the capabilities and limitations of the section in regard to these areas:</p> <ul style="list-style-type: none"> <li>• Marking evidence firearms, recognition, documentation, recovery, and retention of trace evidence from the bore of a firearm prior to test firing.</li> <li>• Determining whether an evidence firearm has been "<i>recently</i>" fired</li> <li>• Determining the manufacturer of a firearm from an examination of a part from a firearm</li> <li>• Determining the manufacturer of a firearm from a photograph and comparing an evidence firearm to a photograph</li> </ul> <p align="center"><b><i>(Use Training Assignment #29 and Practical Exercise #6 to complete this objective.)</i></b></p> <div> <div>_____</div> <div>Training Officer</div> </div> <div> <div>_____</div> <div>Date</div> </div> <p>8.1.21 Become knowledgeable about how to submit evidence firearms to the Laboratory when they have been recovered from water or when they are in a rusted condition. Also, become familiar with the capabilities, limitations, and reservations, which must be considered when restoring such firearms to operating condition to obtain test specimens from them.</p> <div> <div>_____</div> <div>Training Officer</div> </div> <div> <div>_____</div> <div>Date</div> </div> <p>8.1.22 Discuss with your Training Officer how to conduct an examination to determine if a firearm has been altered to fire full automatic. Using a firearm, which has been altered to fire full automatic, conduct this type of examination and verbally report your findings.</p> <div> <div>_____</div> <div>Training Officer</div> </div> <div> <div>_____</div> <div>Date</div> </div> <p><b>8.2 Reference Materials General Preliminary Examinations of Firearms</b></p> <p>The following reference materials serve several purposes:</p> <ul style="list-style-type: none"> <li>• To provide a wider range of additional resources in a given topic</li> <li>• To provide reference materials for future professional use</li> <li>• To gain additional in depth knowledge in a particular subject area</li> </ul> <p>Other references encountered in this category should be made as additional notes at the end of this listing</p> <p>8.2.1 General</p> <p>Burrard, G., <u>Identification of Firearms and Forensic Ballistics</u>, 1<sup>st</sup> edition, Charles Scribner Sons, NY, 1934, revised edition, A.S. Barnes &amp; Co., NY, 1864.</p> <p>Davis, J.E., <u>An Introduction to Tool Marks, Firearms and the Striagraph</u>, Charles C. Thomas, Springfield, IL, 1958.</p>	

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<p>Gunther, J.D., and Gunther, C.O., <u>The Identification of Firearms</u>, John Wiley and Sons, Inc., New York, 1935.</p> <p>Hatcher, J.S., <u>Hatcher's Notebook</u>, Military Service Publishing Company, Harrisburg, PA, 1947.</p> <p>Hatcher, J.S., Jury, F.J. and Weller, J., <u>Firearms Investigation, Identification and Evidence</u>, 2<sup>nd</sup> edition, Stackpole Books, Harrisburg, PA, 1957.</p> <p>Heard, B.E., <u>Handbook of Firearms and Ballistics: Examining and Interpreting Forensic Evidence</u>, John Wiley &amp; Sons, New York, 1997.</p> <p>Mathews, J.H., <u>Firearms Identification</u>, Volumes I □ III, Charles C. Thomas, Springfield, IL, 1962.</p> <p><u>NRA Firearms Fact Book</u>, 3<sup>rd</sup> edition, National Rifle Association, Fairfax, VA, 1989.</p> <p>8.2.2 AFTE Journal</p> <p>Case Notes</p> <p>"California Department of Justice Firearms Toolmark Identification Training Syllabus: Professionalism," 1991; 23(1):559-578.</p> <p>8.2.3 Examination Protocols and Procedure</p> <p>"California Department of Justice Firearms Toolmark Identification Training Syllabus: Professionalism," 1991; 23(2):703-715.</p> <p>8.2.4 Worksheets</p> <p>"California Department of Justice Firearms Toolmark Identification Training Syllabus: Professionalism," 1991; 23(2):712.</p> <p>Cooper, R.E., "Firearm Safety and Trigger Pull Worksheet," 1995; 27(3):vii.</p> <p>Hildebrandt, C., "Problems with Preservation of Evidence for Secondary Gun Examination," 1991; 23(4):982-985.</p> <p>Howe, W.J., "Laboratory Work Sheets," Newsletter #2, Aug. 1969, pp. 13-14.</p> <p>Jordan, T.D., "Oklahoma State Bureau of Investigation Firearms Laboratory: A Pictorial Display," 1979; 11(4):46.</p> <p>Thompson, R.C., "Firearms Malfunction Worksheets," 1983; 15(1):100.</p> <p>Untitled insert, Newsletter #3, Oct. 1969, pp. 17, 18, 21.</p> <p>Untitled insert, Newsletter #4, Dec. 1969, pp. 25, 27.</p> <p>8.2.5 Reporting of Conclusions</p> <p>"California Department of Justice Firearms Toolmark Identification Training Syllabus: Professionalism," 1991; 23(2):718-726.</p>	

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<p>8.2.6 Accidental Discharge Potential</p> <p>Berg, S.O., "Air Gun Safety Designs," 1992; 24(2):165-171.</p> <p>---. "Author's Response," 1991; 23(3):781-783.</p> <p>---. "False Safety Notch: Firearms Design Problem," 1989; 21(4):580-582.</p> <p>---. "Firearms Safety Design Origins and the Firearms," 1996; 28(4):211-221.</p> <p>---. "Gas Handling, Containment, Deflection and Venting for Bolt Action Rifles," 1992; 24(4):375-380.</p> <p>---. "History of Revolver Safeties," 1982; 14(4):29.</p> <p>---. "History of Revolver Safeties," 1989; 21(2):309-313.</p> <p>---. "History of the Derringer Pistol," 1985; 17(3):91.</p> <p>---. "Jar Off: A Critical Firearms Design Factor," 1990; 22(4):390-394.</p> <p>---. "Lever Action Firearms Safeties," 1988; 20(1):64-71.</p> <p>---. "Magazine Safeties: Important Safety Design," 1993; 25(4):301-307.</p> <p>---. "Rohm RG Industries Firearms and Safeties," 1986; 18(2):72.</p> <p>---. "Safety Design: Remington Semiautomatic Shotguns," 1989; 21(3):496-499.</p> <p>---. "Safety Loading/Unloading Designs of Revolvers," 1991; 23(4):931-938.</p> <p>---. "Safety Notch: Design Dangers Through the Ages," 1994; 26(1):4-10.</p> <p>Binsbacher, H., "Caution: When Examining Remington Arms Co. Model of 1911," 1973; 5(3):21.</p> <p>Brundage, D.J., "Bauer Accidental Discharge," 1982; 14(1):62.</p> <p>Buckleton, J.S., and Walsh, K.A.J., "Perplexing Accidental Discharge of Ammunition," 1992; 24(1):46-54.</p> <p>Chenow, R.W., "False Half Cock Position in Semiautomatic Handguns," 1977; 9(2):179.</p> <p>Conrad, W.E., "Browning Hi Power Without Magazine Safety," 1978; 10(2):87.</p> <p>Denio, D.J., "Uzi Semiautomatic Carbine: A Potential Hazard," 1984; 16(3):19.</p> <p>Doyle, J.S., "Possible Malfunction of a Savage 30-30 Rifle," 1983; 15(4):5.</p> <p>Dujanovich, M.B., "Accidental Firearms Discharge," 1985; 17(2):56.</p> <p>Fineman, L.T., "Taurus Recall," 1978; 10(2):33.</p> <p>Fournier, R.J., "COP Pistol: Additional Information," 1983; 15(4):18.</p> <p>---. "Dangerous Doubling," 1982; 14(1):44.</p>	

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